

What is Claimed is:

1. A method of driving a display device which comprises a pixel comprising an EL element and a transistor, comprising the step of:

dividing one frame period into plural sub-frame periods, and

applying one of a first gate voltage and a second gate voltage to a gate electrode of the transistor during each of the plural sub-frame periods,

wherein a drain current of the transistor flows between both electrodes of the EL element to place the EL element into an emitting state when the first gate voltage is applied to the gate electrode of the transistor,

wherein the transistor is placed into a non-conductive state and the EL element is placed into a non-emitting state when the second gate voltage is applied to the gate electrode of the transistor, and

wherein an absolute value of the first gate voltage is not greater than an absolute value of a voltage across a drain and a source of the transistor.

10  
2. A method of driving a display device which comprises a pixel comprising an EL element, a transistor and a resistor, comprising the step of:

dividing one frame period into plural sub-frame periods, and

applying one of a first gate voltage and a second gate voltage to a gate electrode of the transistor during each of the plural sub-frame periods,

wherein a drain current of the transistor flows across the resistor and both electrodes of the EL element and the EL element is placed into an emitting state when the first gate voltage is applied to the transistor,

wherein the transistor is placed into a non-conductive state and the EL element is placed into a non-emitting state when the second gate voltage is applied to the gate electrode of the transistor, and

wherein an absolute value of the first gate voltage is not greater than an absolute value of a voltage across a drain and a source of the transistor.

3. A method of driving a display device according to claim 1, wherein as the ratio of a gate width to a gate length of the transistor is smaller than 1, the absolute value of the first gate voltage applied to the gate electrode of the transistor is larger without exceeding the absolute value of the voltage across the drain and the source of the transistor.

4. A method of driving a display device according to claim 1, wherein the EL element enables color display by using an EL layer which emits light of one color in combination with a color conversion layer.

5. A method of driving a display device according to claim 1, wherein the EL element enables color display by using an EL layer which emits white light, in combination with a color filter.

6. A method of driving a display device according to claim 1, wherein an EL layer of the EL element comprises one of a low molecular weight organic material and a polymeric organic material.

7. A method of driving a display device according to claim 6, wherein the low molecular weight organic material is one of Alq<sub>3</sub> (tris-8-quinolinolato-aluminum) and TPD (triphenylamine derivative).

8. A method of driving a display device according to claim 6, wherein the polymeric organic material is one of PPV (polyphenylene vinylene), PVK (poly(vinylcarbazole), and polycarbonate.

9. A method of driving a display device according to claim 1, wherein the EL layer of the EL element comprises an inorganic material.

10. A video camera, an image reproducing apparatus, a head-mounted display, a mobile telephone or a mobile information terminal which uses the method of driving a display device according to claim 1.

11. A method of driving a display device according to claim 10, wherein as the ratio of a gate width to a gate length of the transistor is smaller than 1, the absolute value of the first gate voltage applied to the gate electrode of the transistor is larger without exceeding the absolute value of the voltage across the drain and the source of the transistor.

12. A method of driving a display device according to claim 10, wherein the EL element enables color display by using an EL layer which emits light of one color in combination with a color conversion layer.

13. A method of driving a display device according to claim <sup>10</sup>~~2~~, wherein the EL element enables color display by using an EL layer which emits white light, in combination with a color filter.

14. A method of driving a display device according to claim <sup>10</sup>~~2~~, wherein an EL layer of the EL element comprises one of a low molecular weight organic material and a polymeric organic material.

15. A method of driving a display device according to claim 14, wherein the low molecular weight organic material is one of Alq<sub>3</sub> (tris-8-quinolinolato-aluminum) and TPD (triphenylamine derivative).

16. A method of driving a display device according to claim 14, wherein the polymeric organic material is one of PPV (polyphenylene vinylene), PVK (poly(vinylcarbazole), and polycarbonate.

17. A method of driving a display device according to claim <sup>10</sup>~~2~~, wherein the EL layer of the EL element comprises an inorganic material.

18. A video camera, an image reproducing apparatus, a head-mounted display, a mobile telephone or a mobile information terminal which uses the method of driving a display device according to claim <sup>10</sup>~~2~~.

19. A method of driving a display device which comprises a pixel comprising an EL element and a transistor, comprising the step of:

dividing one frame period into plural sub-frame periods, and

applying one of a first gate voltage and a second gate voltage to a gate electrode of the transistor during each of the plural sub-frame periods,

wherein a drain current of the transistor flows between both electrodes of the EL element to place the EL element into an emitting state when the first gate voltage is applied to the gate electrode of the transistor,

wherein the transistor is placed into a non-conductive state and the EL element is placed into a non-emitting state when the second gate voltage is applied to the gate electrode of the transistor,

wherein an absolute value of the first gate voltage is not greater than an absolute value of a voltage across a drain and a source of the transistor, and

wherein as the ratio of a gate width to a gate length of the transistor is smaller than 1, the absolute value of the first gate voltage applied to the gate electrode of the transistor is larger without exceeding the absolute value of the voltage across the drain and the source of the transistor.

20. A method of driving a display device according to claim 19, wherein the EL element enables color display by using an EL layer which emits light of one color in combination with a color conversion layer.

21. A method of driving a display device according to claim 19, wherein the EL element enables color display by using an EL layer which emits white light, in combination with a color filter.

22. A method of driving a display device according to claim 19, wherein an EL layer of the EL element comprises one of a low molecular weight organic material and a polymeric organic material.

23. A method of driving a display device according to claim 22, wherein the low molecular weight organic material is one of Alq<sub>3</sub> (tris-8-quinolinolato-aluminum) and TPD (triphenylamine derivative).

24. A method of driving a display device according to claim 22, wherein the polymeric organic material is one of PPV (polyphenylene vinylene), PVK (poly(vinylcarbazole), and polycarbonate.

25. A method of driving a display device according to claim 19, wherein the EL layer of the EL element comprises an inorganic material.

26. A video camera, an image reproducing apparatus, a head-mounted display, a mobile telephone or a mobile information terminal which uses the method of driving a display device according to claim 19.

27. A method of driving a display device which comprises a pixel comprising an EL element and a transistor, comprising the step of:

dividing one frame period into plural sub-frame periods, and

applying one of a first gate voltage and a second gate voltage to a gate electrode of the transistor during each of the plural sub-frame periods,

wherein the EL element is placed into an emitting state when the first gate voltage is applied to the gate electrode of the transistor,

wherein the EL element is placed into a non-emitting state when the second gate voltage is applied to the gate electrode of the transistor, and

wherein an absolute value of the first gate voltage is not greater than an absolute value of a voltage across a drain and a source of the transistor.

36  
28. A method of driving a display device which comprises a pixel comprising an EL element, a transistor and a resistor, comprising the step of:

dividing one frame period into plural sub-frame periods, and

applying one of a first gate voltage and a second gate voltage to a gate electrode of the transistor during each of the plural sub-frame periods,

wherein the EL element is placed into an emitting state when the first gate voltage is applied to the transistor,

wherein the EL element is placed into a non-emitting state when the second gate voltage is applied to the gate electrode of the transistor, and

wherein an absolute value of the first gate voltage is not greater than an absolute value of a voltage across a drain and a source of the transistor.

29. A method of driving a display device according to claim 27, wherein as the ratio of a gate width to a gate length of the transistor is smaller than 1, the absolute value of the first gate voltage applied to the gate electrode of the transistor is larger without exceeding the absolute value of the voltage across the drain and the source of the transistor.

30. A method of driving a display device according to claim 27, wherein the EL element enables color display by using an EL layer which emits light of one color in combination with a color conversion layer.

31. A method of driving a display device according to claim 27, wherein the EL element enables color display by using an EL layer which emits white light, in combination with a color filter.

32. A method of driving a display device according to claim 27, wherein an EL layer of the EL element comprises one of a low molecular weight organic material and a polymeric organic material.

33. A method of driving a display device according to claim 32, wherein the low molecular weight organic material is one of Alq<sub>3</sub> (tris-8-quinolinolato-aluminum) and TPD (triphenylamine derivative).

34. A method of driving a display device according to claim 32, wherein the polymeric organic material is one of PPV (polyphenylene vinylene), PVK (poly(vinylcarbazole), and polycarbonate.



35. A method of driving a display device according to claim 27, wherein the EL layer of the EL element comprises an inorganic material.

28/ 36. A video camera, an image reproducing apparatus, a head-mounted display, a mobile telephone or a mobile information terminal which uses the method of driving a display device according to claim 27.

37. A method of driving a display device according to claim 36, wherein as the ratio of a gate width to a gate length of the transistor is smaller than 1, the absolute value of the first gate voltage applied to the gate electrode of the transistor is larger without exceeding the absolute value of the voltage across the drain and the source of the transistor.

38. A method of driving a display device according to claim 36, wherein the EL element enables color display by using an EL layer which emits light of one color in combination with a color conversion layer.

39. A method of driving a display device according to claim 36, wherein the EL element enables color display by using an EL layer which emits white light, in combination with a color filter.

40. A method of driving a display device according to claim 36, wherein an EL layer of the EL element comprises one of a low molecular weight organic material and a polymeric organic material.

41. A method of driving a display device according to claim 40, wherein the low molecular weight organic material is one of Alq<sub>3</sub> (tris-8-quinolinolato-aluminum) and TPD (triphenylamine derivative).

42. A method of driving a display device according to claim 40, wherein the polymeric organic material is one of PPV (polyphenylene vinylene), PVK (poly(vinylcarbazole), and polycarbonate.

43. A method of driving a display device according to claim <sup>36</sup>~~28~~, wherein the EL layer of the EL element comprises an inorganic material.

44. A video camera, an image reproducing apparatus, a head-mounted display, a mobile telephone or a mobile information terminal which uses the method of driving a display device according to claim <sup>36</sup>~~28~~.

45. A method of driving a display device which comprises a pixel comprising an EL element and a transistor, comprising the step of:

dividing one frame period into plural sub-frame periods, and

applying one of a first gate voltage and a second gate voltage to a gate electrode of the transistor during each of the plural sub-frame periods,

wherein the EL element is placed into an emitting state when the first gate voltage is applied to the gate electrode of the transistor,

wherein the EL element is placed into a non-emitting state when the second gate voltage is applied to the gate electrode of the transistor,

wherein an absolute value of the first gate voltage is not greater than an absolute value of a voltage across a drain and a source of the transistor, and

wherein as the ratio of a gate width to a gate length of the transistor is smaller than 1, the absolute value of the first gate voltage applied to the gate electrode of the transistor is larger without exceeding the absolute value of the voltage across the drain and the source of the transistor.

46. A method of driving a display device according to claim 45, wherein the EL element enables color display by using an EL layer which emits light of one color in combination with a color conversion layer.

47. A method of driving a display device according to claim 45, wherein the EL element enables color display by using an EL layer which emits white light, in combination with a color filter.

48. A method of driving a display device according to claim 45, wherein an EL layer of the EL element comprises one of a low molecular weight organic material and a polymeric organic material.

49. A method of driving a display device according to claim 48, wherein the low molecular weight organic material is one of Alq<sub>3</sub> (tris-8-quinolinolato-aluminum) and TPD (triphenylamine derivative).

50. A method of driving a display device according to claim 48, wherein the polymeric organic material is one of PPV (polyphenylene vinylene), PVK (poly(vinylcarbazole), and polycarbonate.

51. A method of driving a display device according to claim 45, wherein the EL layer of the EL element comprises an inorganic material.

52. A video camera, an image reproducing apparatus, a head-mounted display, a mobile telephone or a mobile information terminal which uses the method of driving a display device according to claim 45.